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Conference Abstract

Embedding Computer Vision in Citizen Science

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Abstract

The rapid rise of Artificial Intelligence (AI) methods has presented new opportunities for those who work with biodiversity data. Computer vision, in particular where computers can be trained to identify species in digital photographs, has significant potential to address a number of existing challenges in citizen science.

The Biological Records Centre (www.brc.ac.uk) has been a central focus for terrestrial and freshwater citizen science in the United Kingdom for over 50 years. We will present our research on how computer vision can be embedded in citizen science, addressing three important questions.

1. *How can contextual information, such as time of year, be included in computer vision?* A naturalist will use a wealth of ecological knowledge about species in combination with information about where and when the image was taken to augment their decision making; we should emulate this in our AI.
2. *How can citizen scientists be best supported by computer vision?* Our ambition is not to replace identification skills with AI but to use AI to support the learning process.
3. *How can computer vision support our limited resource of expert verifiers as data volumes increase?* We receive more and more data each year, which puts a greater demand on our expert verifiers, who review all records to ensure data quality. We have been exploring how computer vision can lighten this workload.

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We will present work that addresses these questions including: developing machine learning techniques that incorporate ecological information as well as images to arrive at a species classification; co-designing an identification tool to help farmers identify flowers beneficial to wildlife; and assessing the optimal combination of computer vision and expert verification to improve our verification systems.

Keywords

AI, machine learning, computer vision, citizen science, verification, invasive species

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